

January 31, 2003

Federal Communications Commission
Washington, DC 20554

Re: ET Docket No. 02-380 and WT Docket 02-381

Dear Commission:

We would like to thank the commission for giving us the opportunity to comment on the very important matter of facilitating the provision of Spectrum-Based services to rural areas, and as well to comment on the matter of additional spectrum for unlicensed devices below 900 MHz and in the 3 GHz band. We have taken the approach of providing one document that comments on both ET Docket No. 02-380 and WT Docket 02-381, and will file this document against both docket numbers.

Redline Communications Inc. is a privately held Canadian company, focusing on product innovations in the broadband fixed wireless industry. Redline's products deliver a cost-effective wireless solution for backhaul and infrastructure, used by access providers, enterprises, wireless ISPs and more.

Redline was founded in 1999. It has approximately 110 employees, and is currently shipping a license exempt product line using 5 GHz license-exempt technology. Many of Redline's employees have several man-years of experience working with other leading licensed and license-exempt wireless product developers serving the needs of rural operators.

Our comments are organized as follows:

1. Wireless Internet Service Providers (WISPS) are proving to be important contributors in the effort to bring broadband services to rural areas.
2. License Exempt Technologies are proving to be important technologies for providing broadband service to rural areas.
3. What do WISPS need to be successful in growing their businesses?
4. We provide some specific suggestions for improving the business conditions for rural broadband access.

Wireless Internet Service Providers (WISPS) are proving to be important contributors in the effort to bring broadband services to rural areas.

The number of private Wireless Internet Service Providers has grown rapidly in the past few years. Current estimates are that there are now somewhere between 2,000 and 5,000 active WISPS in the USA.

Although many WISPS are recently started small businesses, many have grown to the point that they are servicing hundreds and in some cases thousands of subscribers. Most of the WISPS are servicing rural locations.

WISPS are providing high speed data networking services to rural business, farms, residences, hospitals, school boards, and governments.

Small WISPS have proven the willingness and the capability to provide service to low density areas that have been largely ignored by local telecom companies, power companies, cable providers, and larger wireless providers.

WISPS have demonstrated the willingness to invest in low density areas due to their economic advantage of low infrastructure costs, low operating costs, local knowledge and accessibility to residents. Their ability to tailor service policies to local needs have been used to their advantage.

There are some parallels to the cooperative movement that led to the creation of electrical cooperatives and telecom cooperatives in the early 20th century. In this case, local companies have taken up the task of providing local service to low density areas that are being treated as a low priority by large companies.

License-Exempt Technologies are proving to be important technologies for providing broadband service to rural areas

For a rural WISP, license-exempt technologies have proven to be an important factor in the success of their business:

- They do not have to be burdened with the costs of buying or leasing spectrum licenses
- They can cost effectively target small selected areas in need of services
- The radio equipment is generally less expensive to purchase and to install than licensed band equipment
- Since licenses do not have to be acquired, rapid implementations are possible to provide coverage into a new area

What do rural WISPS need to be more successful growing their businesses?

Some of the business conditions that rural WISPS require to expand their businesses to provide more rural coverage:

1. Access to lower cost backhaul services.
2. Access to license exempt spectrum that is not impaired by consumer and indoor-use products
3. Additional Spectrum
4. Spectrum use rules that recognize the special characteristics of rural areas

Access to lower cost to backhaul services:

Backhaul service in rural areas is frequently prohibitively expensive or unavailable. In many cases an affordable circuit is simply not available or affordable for a rural tower location. To solve this problem WISPS are increasingly providing their own wireless backhaul links. Redline and other manufacturers are now making more cost effective license-exempt point-to-point backhaul link equipment using the 5.725-5.850 MHz band that can reach 50 miles or more to extend the availability of service to more remote sites.

The increased use of fixed point-to-point microwave links (in the 3700-4200 MHz bands, and in the 5925-6425 MHz bands) by rural telcos and WISPS would also help extend backhaul coverage to rural areas. We believe that a significant reduction in the cost of equipment to set up point-to-point links would encourage the availability of backhaul links. We suggest that the commission consider changing the technical requirements of these bands so that some equipment developed for use in the license exempt 5725-5825 MHz could be readily adapted for use in the 3700-4200 and 5925-6425 bands. We anticipate that this equipment will be much less expensive and hence much more accessible to WISPS and rural telcos. Some regulations such as the [101.143] microwave modulation regulations specifying minimum Mbits per second per link, may have to be reduced to allow this flexibility. Time Division Duplexing (TDD) is another common characteristic of some 5725-5825 products. The ability to use TDD across the 3700-4200 / 5925-6425 bands would allow the cross-over of more 5725-5825 products. In many applications, TDD would use the available spectrum more efficiently.

Access to license exempt spectrum that is not impaired by consumer and indoor-use products:

License exempt spectrum set aside primarily for WISP point to multipoint outdoor use would be beneficial. The relative freedom from legal and licensing start-up costs in the unlicensed bands is a major contributor to the success of WISPS. However, the unlicensed bands that are available to WISPS are also available to many non-WISP part-15 users. A result of this situation is much uncertainty for the WISP as to whether an

installation that is working today will be working in the future due to new non-WISP interferers in the area. This uncertainty makes it more difficult for WISPS to justify larger investments, or to attract investment capital to expand their businesses.

Unlicensed spectrum that is primarily useable by WISPS would help WISPS to build more reliable networks.

While it is desirable to have more output power for rural applications, the lack of control over misuse of transmission power in the license exempt bands leads to the real possibility that bands will become unusable for many outdoor WISP applications. We support any measures that discourage the use of products certified only for indoor-use in an outdoor application. It should not be easy for a technically inclined consumer to modify an indoor product to be attached to an amplifier or a high gain antenna. For example indoor use products could be sold only with integrated antennas, and with no easily accessible antenna connectors. We also encourage lower power limits for products that designated for indoor-use only.

Additional Spectrum:

5 GHz Bands

The 5470-5725 MHz bands being considered in many countries provide an opportunity to offer more outdoor-use only spectrum for WISPs in rural localities.

Providers of spectrum based broadband services would appreciate and would make use of any additional spectrum that could be allocated.

The 1 Watt EIRP limit envisioned by most regulatory jurisdictions (such as described in ETSI draft EN 301 893) may be appropriate for fairly short distances, and for point-to-point links. For rural applications, point-to-multipoint operations at 1 Watt EIRP limitation would be fairly restrictive. We would encourage the commission to consider setting the EIRP level for this band at 4 Watts.

Dynamic Frequency Selection (DFS) techniques are being discussed by regulatory and industry groups for radar interference control.

As a future consideration, DFS could be problematic for WISPS, as it may impair their ability to roll out large point-to-multipoint networks, or networks with multiple cells, or for multiple networks operated by separate owners. The coordination that would be required for DFS may prove to be impractical.

Unused TV Spectrum

With regard to unused TV spectrum, the opportunity to use spectrum in the unused television channels on license exempt basis could be quite attractive for WISP services. The sub-1GHz frequencies offer excellent non line of sight propagation properties for the longer distances, frequent tree cover, and longer distances involved with rural areas.

The bandwidth between television channels is adequate for rural WISP services. With improving spectral efficiency, even a single 6 MHz channel could provide a significant level of service for a rural community.

These channels would be more attractive if they could be allocated without the use of Dynamic Frequency Selection. Outdoor fixed wireless point-to-multipoint networks that automatically and randomly change channels (as in DFS) require more study to determine if such a technique would be workable.

Spectrum use rules that encourage the development of cost effective products for rural applications.

2GHz to 6 GHz

For license exempt subscriber-end equipment in the 2.4 GHz and 5.8 GHz bands, we would recommend maintaining current transmitter radio output dBi power maximums.

We would respectfully ask the commission to explicitly clarify whether high gain directional antennas at the subscriber end of point-to-multipoint networks are able to use point-to-point EIRP limits.

At the base station end of point-to-multipoint networks rural operators would benefit from being able to cover a wide azimuth per base station, to provide 360-degree coverage with 4 or fewer base station radios, while still achieving longer distances. In order to accomplish that, a higher base station EIRP limit would be beneficial.

3650-3700 MHz

We would support making the frequency band 3650-3700 band available for license exempt outdoor-only WISP operations if this band could be primarily allocated for WISP operations, and allow higher EIRP outputs that currently allowed in the 5.8 GHz band, and not require Dynamic Frequency Selection type measures.

1 GHz and Lower

At sub 1GHz frequencies, antennas are physically larger and quickly become too expensive as a way to achieve necessary EIRP, particularly for rural farms and

residences. Subscriber antennas beyond approximately 10 dBi gain become impractical. We would investigate the possibility of allowing higher radio (dBi) outputs than the current 902-928 MHz limits, but limiting the higher power to products certified for outdoor WISP use.

Some specific requests to improve the business and technical conditions for rural broadband access.

License to Smaller Service Areas:

Although many WISPS would benefit from the interference-protection advantages provided by a license spectrum area, most WISPs are not in a position to acquire a license that covers an entire Rural Service Area (RSA).

We agree with the Commission's practise of enhancing rural telco participation in spectrum auctions by adopting service areas of varying sizes. We recommend consideration of a license arrangement that would allow small businesses to acquire spectrum rights for small communities and rural areas in smaller service areas than RSAs, perhaps at the county level. For these small business licenses, a single entity might be limited to control of a single county, promoting small business and designated entities. To encourage disaggregation, there could be a limit of one county per entity.

Rural Telecom and Rural Power Companies:

In many respects existing rural telecom companies and rural power companies are well positioned to offer broadband wireless Internet services. With a few notable exceptions, these organizations have chosen not to do so.

Although privately owned WISPS have rapidly expanded the coverage of rural markets, the participation of more of the existing telecom and power organizations would help expand rural broadband coverage and offer more competition.

We believe that there are a few plausible explanations for this relative lack of participation: The business case for these organizations to participate in the WISP business has not been compelling; there have been high profile failures of organizations using licensed band technologies to roll out broadband services, many rural telcos have been focussed on the opportunity in their more densely populated centers to use their existing copper with DSL or cable technology; they are not comfortable using license exempt technology where there is more uncertainty about interference from other users.

As private WISPS continue to prove the viability of license exempt technologies, we believe that more rural telcos and energy companies will participate in the market. However we also believe that the availability of more license exempt spectrum and WISP-only license exempt spectrum with primary user status would encourage the participation of these organizations.

Sincerely,

Mitch Vine

Director of Product Marketing

mvine@redlinecommunications.com